

ANNOUNCEMENT OF OBJECTIVES AND
PLANS FOR FUTURE OIL AND GAS
EXPLORATION IN GREENLAND



GOVERNMENT OF GREENLAND
BUREAU OF MINERALS AND PETROLEUM

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Strategy regarding exploration and exploitation of hydrocarbons in Greenland, 2003

1. Introduction

In accordance with the recommendation of the Joint Committee on Mineral Resources in Greenland, the Government of Greenland and the Danish Government in June 2003 approved the new strategy concerning exploration and exploitation of hydrocarbons in Greenland. This document presents a resumé of the main elements of the approved strategy, including a 2004 licence round in four areas offshore West Greenland (Figure 1).

The incentive to prepare a new hydrocarbon strategy was principally the fact that most of the objectives of the hydrocarbon strategy adopted in 1999 have now been achieved, including not least the acquisition and compilation of a greatly enlarged body of seismic and other geophysical data offshore West Greenland. This resulted in a licence round in part of this region and the award of a new exploration licence in the area in 2002.

2. Overall objectives of the new strategy

There is broad political consensus in Greenland that efforts should be made to develop the mineral resources sector into a sustainable industry that can make a positive contribution to the economic development of the country and the creation of new jobs. This goal is an important element in the long-term economic policy, which aims at supporting the development of industries other than fishing, with a view to reducing Greenland's present heavy dependence on yearly appropriations from Denmark.

The development of the hydrocarbon sector must proceed in a way that is of the greatest possible benefit to Greenland society. This society must be assured of a reasonable share of the profits accruing from the exploitation of hydrocarbons, just as local communities must be assured of insight and information concerning hydrocarbon activities, in order amongst other things that the local work force and local firms are involved to the greatest possible extent.

A clear political condition for all activities related to the development of mineral resources in Greenland, not least exploration for and exploitation of hydrocarbons, is that these activities must be carried out with due regard for safety and the environment. The arctic environment is very vulnerable, and Greenland's economic life and culture are closely bound to nature and the environment.

It is thus with a view to increasing income and employment that hydrocarbon activities will be encouraged. However, if discoveries are to be made that can be exploited, it is necessary that exploration activity is maintained at a sufficiently high level. The central aim of the strategy is therefore to provide a competitive framework in order to generate not only industry interest but also a willingness to invest in petroleum exploration in Greenland.

3. Status of oil and gas exploration activities carried out to date

Exploration for hydrocarbons in the maritime area offshore West Greenland was initiated in the beginning of the 1970s. In the following years five exploration wells were drilled in areas with moderate water depths, but only in one well, Kangâmiut-1, were traces of hydrocarbons found.

In 1992 the Geological Survey of Denmark and Greenland (GEUS) discovered oil seeps on the south-west side of Nuussuaq peninsula, and in the following years seeps were recorded over a wide area extending from northern Disko through Nuussuaq to the southern part of Svartenhuk peninsula (70°–71°30'N). In 1996 the Canadian company GrønArctic Energy Inc. drilled an exploration well on Nuussuaq peninsula in which traces of hydrocarbons were found.

In 2000 a group led by Statoil drilled an exploration well offshore central West Greenland. Even though the well, Qulleq-1, did not strike hydrocarbons, it provided much valuable new information of importance for the planning of future exploration activities.

In the period 1999–2002 commercial geophysical companies acquired extensive new speculative seismic data offshore West Greenland in preparation for the 2002 licence round and anticipated later rounds.

The recently acquired seismic data have revealed the existence of hitherto unknown sedimentary basins offshore West Greenland. A provisional integrated evaluation of seismic, gravity and magnetic data has indicated the presence of an interconnected basin system along the so-called Ungava Fracture Zone. This basin system may link the petroleum-prospective areas off Labrador on the east coast of Canada with the observed oil seeps on Disko and Nuussuaq.

4. Overall strategy

4.1. Choice of licensing procedures

It is anticipated that the announcement of a licence round in Greenland will draw attention to the hydrocarbon potential of the areas on offer. Furthermore it is expected that the announcement of a coming licence round will provide an incentive for seismic companies to acquire new data for use by oil companies in their assessment of the area.

In Greenland an open-door procedure, allowing for applications for licences to be made at any time, will still be used for less attractive areas which are unlikely to attract competitive bids. The open-door procedure is used in areas with a scant cover of seismic data or areas where promising geological structures have not yet been observed.

On the basis of industry feed-back at meetings held with a number of major European and American oil companies and experience gained from the 2002 licence round, it is considered that an announcement in mid-2003 that a licence round offshore West Greenland is being planned for 2004 would be the best way of focusing industry interest in this region.

The seismic industry is now planning to acquire new seismic data in the 2004 licence round areas.

4.2. Status of petroleum exploration in West Greenland

West Greenland between c. 63° and c. 69°N

Acquisition of more than 24,000 km seismic lines in the period 1999–2002 was focused mainly on providing a broad regional cover of the sedimentary basins and structures offshore southern West Greenland, together with a more detailed grid in the former licence areas Fylla and Sisimiut-West. In all, more than 45,000 km of new data have been acquired off West Greenland since 1990 (Figure 2).

The areas with thick sedimentary basins offshore central West Greenland extend over a total area of more than 130,000 km², a large part of which is expected to have a considerable petroleum potential. Within these areas several different leads and prospects have been identified, some of them with a potential for giant hydrocarbon discoveries.

West Greenland between c. 69° and c. 71°N

The data coverage in the offshore area between c. 69°N and the southern boundary of the KANUMAS preference area at c. 71°N has been improved in recent years, not least in connection with seismic acquisition in the years 2000–2002. A provisional evaluation of data acquired in this area in 2002 was carried out in April 2003, and it was found that there are some very large potential trap structures in parts of the area. It is expected that the discovery of these very large structures in an area with known active oil seeps onshore will increase industry interest in this area, both the offshore and onshore. However, there is a need for more data and new exploration models before there is sufficient basis for including the area between c. 69° and 71°N in a coming licence round.

South-West Greenland (south of c. 63°N)

The data coverage offshore South-West Greenland is still sparse, and therefore there is only limited knowledge about the subsurface geology. Furthermore the area is characterised by difficult operative conditions, chiefly due to large water depths. However, basins and structures observed north of 63°N appeared to continue southwards and therefore the Bureau of Minerals and Petroleum in co-operation with TGS-NOPEC has acquired nearly 2,000 km of new seismic data in the area between 62° and 63°N which, combined with data from the early 1990s, provide an improved cover in this area. In the area between 62° and 63°N there are some interesting basins and structures. However, it is considered that there is still a need for more knowledge about the area as a whole before it is mature enough for inclusion in a licence round.

Other areas

As for the areas offshore West Greenland north of 71°N and off East and North-East Greenland, here the data coverage and operational conditions are such that no significant industry interest in commercial exploration in these areas can be expected in the near future. The same is the case for all onshore areas with the exceptions of the Disko-Nuussuaq area in West Greenland and also Jameson Land on the east coast.

Priority areas

The hydrocarbon strategy operational in the coming years will be focused mainly on areas where a regional geological evaluation and exploration to date have revealed the greatest petroleum potential and where exploration and exploitation can be carried out in a responsible manner with regard to safety and the environment, viz.:

- ▶ Areas offshore West Greenland between *c.* 63° and *c.* 69°N that presently have the best data cover and greatest exploration potential.

- ▶ Selected areas both onshore and offshore central West Greenland between *c.* 69° and 71°N where the newest data suggest a greater prospectivity than previously supposed.

4.3. Health, safety and environment (HSE) in petroleum exploration

Physical and biological environmental conditions are vitally important factors to be taken into account when hydrocarbon activities are initiated in Greenland. From a biological point of view, offshore West Greenland south of *c.* 71°N is the most productive maritime area in Greenland. It is important for birds and marine mammals, and the most of Greenland's fishing takes place in this area. Since fishing has an important social and economic role, particular attention must be paid to this industry in the future development of exploration activities offshore.

Prior to the 2002 licence round an oil spill sensitivity atlas was prepared for the coastal region of West Greenland between 62° and 68°N. This provides a substantial source of information when drawing up contingency plans for combating oil spills resulting from accidents in the area. In 2003 an extension of environmental mapping of areas vulnerable to oil spills will be completed so that the whole of West Greenland between 60°N and 72°N will be covered.

5. Licence rounds

5.1. Delimitation of areas

The selection and delimitation of areas to be offered for licensing was governed mainly by the mapping of giant structures using seismic data acquired since 1999.

Other factors influencing the choice of areas were:

- ▶ information from other geophysical surveys such as gravity and magnetic mapping;
- ▶ new information concerning sedimentology, biostratigraphy, organic geochemistry, etc.;
- ▶ satellite image studies of oil slicks on the surface of the sea that can reveal possible oil seeps at sea bed;
- ▶ identification of areas with favourable ice conditions;
- ▶ views expressed by oil companies during meetings and seminars.

Four areas have been chosen to be included in a coming licence round. These offshore areas (nos 1–4) are shown in Figure 1, viz.:

- (1) Part of the Lady Franklin Basin between *c.* 63° and 65°N, covering approx. 10,500 km².
- (2) The Kangaamiut Basin and Ridge at *c.* 66°N, covering approx. 4,900 km².
- (3) Part of the Ikermiut Fault Zone/Sisimiut Basin between *c.* 67° and 68°N, covering approx. 4,900 km².
- (4) Parts of the Atammik and Fylla Structural Complexes between *c.* 63° and 64°N, covering approx. 11,200 km².

The four areas to be offered for licensing have a total area of *c.* 32,000 km². The areas lie mainly within the area offered in the 2002 licence round which extended from 63° to 68°N. Smaller parts of these areas extend into the areas designated open-door areas in the 1999 strategy.

Those areas between 63° and 68°N that are not being recommended for inclusion in the 2004 licence round will remain closed for the time being. In the long run industry interest in these areas

will be decisive for whether they will be offered in new rounds, or instead be dealt with under other procedures.

5.2. Conditions governing the licence round

Drafting of the new strategy and timetable has been based on an acceptance of present realities, in particular the fact that the oil industry regards Greenland as a frontier area. Therefore it has been important to establish a stable and consistent legal/political framework so as to minimise industry's perception of risk.

General conditions

A model licence is available which sets out the general conditions for future licences. The general conditions outlined in this model licence include specifications regarding the duration of the licence, the rights of other parties in the licence area, regulations concerning technical and environmental matters, agreements concerning training of personnel, procedures for approval of activities, inspection, obligations in the event of the licensee defaulting, reporting, employment, choice of suppliers, mutual agreements between partners in the licence, transfer of the licence, insurance and guarantees, and obligations on expiry or relinquishment of the licence.

Negotiations with applicants will be limited to those terms constituting competitive parameters. The most important of these are work programmes, duration of sub-periods (see below) and size of licence area.

Exploration licences are issued for a 10-year period, with a right of extension to 30 years in the event of production taking place. The exploration period is divided into sub-periods.

To each sub-period a specific work commitment is defined. Before the end of each sub-period the licensee must either commit himself to carry out the work programme allotted to the following sub-period or relinquish the licence.

Work programmes must be accompanied by documentation that the applicant is willing to and has the technical capability to carry out the programmes, and also that the applicant has sufficient financial resources to carry through the programme.

Economic terms

The economic terms under which exploration and exploitation of hydrocarbons shall be carried out include standard taxation, royalty, carried participation of NUNAOIL A/S, various fees, and training commitments.

Corporate tax

Corporate tax is 30%.

Surplus royalty

This tax is due first when investment has been recovered and the company has achieved a specified internal return on investment.

In the 2002 model licence it was stipulated that a 7.5% surplus royalty should be paid when the internal return is higher than 25% before tax, rising to 17.5% and then 30% when the internal return has increased to over 32.5% and 40% respectively.

Public participation

NUNAOIL A/S will continue to be incorporated as a public participant in all new licences, being carried in the exploration phase. If production is carried into effect, NUNAOIL will pay a share of the development costs equivalent to the company's share in the consortium.

Fees

Fees are charged to cover the authorities' expenses connected to administrating the licence and monitoring activities. Costs of training programmes are met by the licensee.

Both general conditions and economic terms will be determined finally by the Government of Greenland and the Danish Government prior to the official opening of the licence round in April 2004.

5.3. Milestones for planning of the licence round

The main milestones leading up to the 2004 licence round offshore West Greenland are:

- ▶ 1 April 2004: official announcement of the licence round ;
- ▶ 1. October 2004: closing data for submission of applications;
- ▶ December 2004/January 2005: award of licence(s).

6. Open-door procedure

An open-door procedure will continue to be operative in areas where industry interest has been modest and the data coverage is limited. Within the open-door areas applications for licences can be submitted at any time during the period 1 October–31 May. Applications received in the period 1 June–30 September will be treated as having been delivered on 1 October.

6.1. Offshore areas

Based on the present status of exploration in the open-door areas (see above), it has been decided that:

- ▶ The area between *c.* 68°N and 71°N (excluding what falls within the KANUMAS preference area and the 2004 licence round, but including Disko-Nuussuaq) will be closed for the period 31 May to 31 December 2003. During this period a re-evaluation of prospectivity of the area will be carried out. On the basis of this re-evaluation a decision will be made as to whether the status of the area should be changed or the terms revised.
- ▶ The offshore area between 60° and 63°N (excluding what falls within the 2004 licence round) will continue to be an open-door area.

6.2. Land areas

As a consequence of earlier exploration activities, Jameson Land in East Greenland is an open-door area today. The area has a petroleum potential, but it has been difficult to identify large potential trap structures. Since there have been no changes in preconditions in the area since it was classified as open-door area, the open-door status will be maintained for the time being. Should perceptions of the prospectivity of the area change or other factors require it, the status will be reconsidered.

The Disko-Nuussuaq area is closed until 31 December 2003 for a re-evaluation of prospectivity of the area. On the basis of this re-evaluation a decision will be made as to whether the status of the area should be changed or the terms revised.

6.3. Terms governing licences awarded under open-door procedure

The present terms for exploration and exploitation licences are stipulated in a model licence. These include surplus royalty, carried partnership, and fees. The main economic terms are:

- ▶ Corporate tax is 30 %.
- ▶ A surplus royalty of 5% shall be paid when the internal return exceeds 25% before tax, rising to 10% and 15% when the internal return exceeds 32.5% and 40% respectively.
- ▶ Standard taxes and fees.
- ▶ NUNAOIL A/S shall be a carried partner in the exploration phase with a share of 8%.